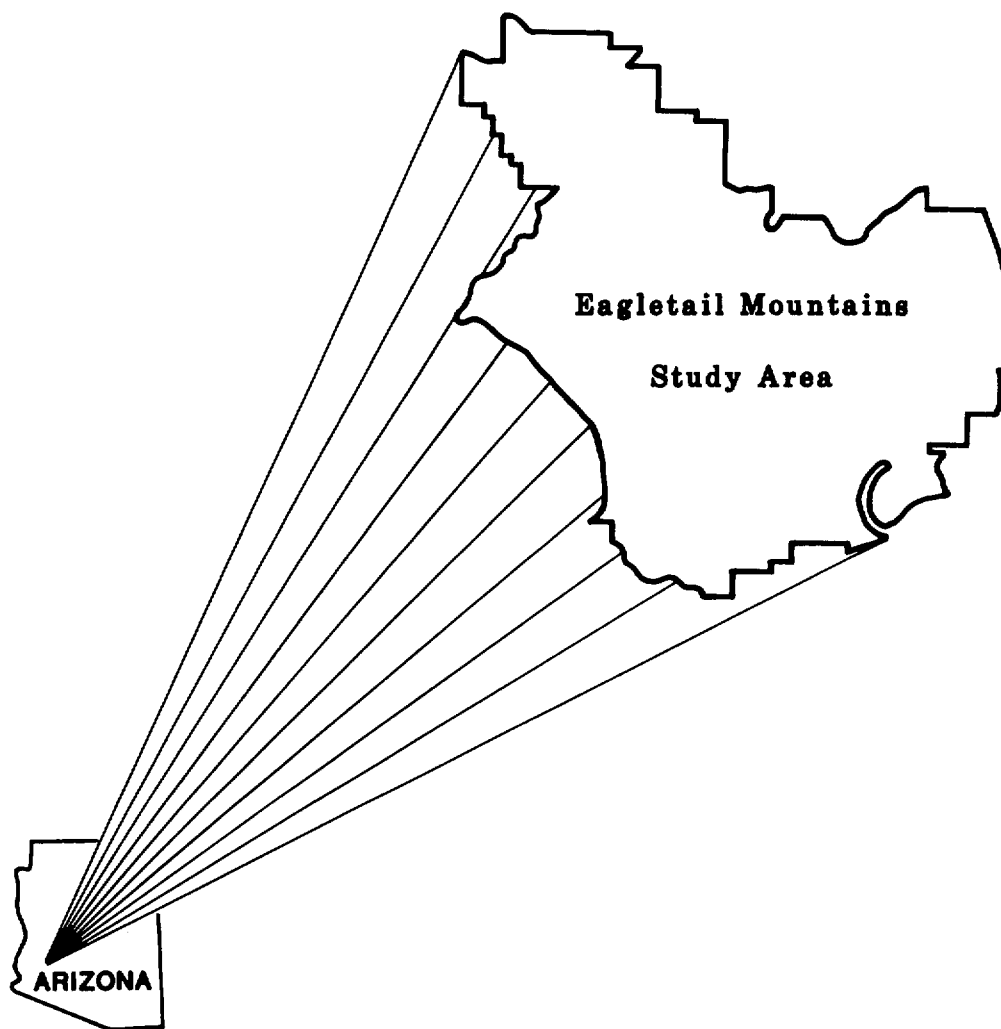




Mineral Land Assessment
Open File Report/1986

**Mineral Investigation of a Part of the Eagletail
Mountains Wilderness Study Area (AZ-020-128),
La Paz, Maricopa, and Yuma Counties, Arizona**



**BUREAU OF MINES
UNITED STATES DEPARTMENT OF THE INTERIOR**

MINERAL INVESTIGATION OF A PART OF THE EAGLETAIL MOUNTAINS WILDERNESS
STUDY AREA (AZ-020-128), LA PAZ, MARICOPA, AND YUMA COUNTIES, ARIZONA

by

Michael E. Lane

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1986

Intermountain Field Operations Center, Denver, Colorado

UNITED STATES DEPARTMENT OF THE INTERIOR
Donald P. Hodel, Secretary

BUREAU OF MINES
Robert C. Horton, Director

PREFACE

The Federal Land Policy and Management Act of 1976 (Public Law 94-579) requires the U.S. Geological Survey and the U.S. Bureau of Mines to conduct mineral surveys on certain areas to determine the mineral values, if any, that may be present. Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a mineral survey of a part of the Eagletail Mountains Wilderness Study Area (AZ-020-128), La Paz, Maricopa, and Yuma Counties, Arizona.

This open-file report summarizes the results of a Bureau of Mines wilderness study. The report is preliminary and has not been edited or reviewed for conformity with the Bureau of Mines editorial standards. This study was conducted by personnel from the Branch of Mineral Land Assessment (MLA), Intermountain Field Operations Center, Building 20, Denver Federal Center, Denver, CO 80225.

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UNIT OF MEASURE ABBREVIATIONS USED IN THIS REPORT

ft foot (feet)

mi mile(s)

oz/st troy ounce per short ton (2,000 pounds)

% percent

°C degree Celsius

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by

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SUMMARY

In April and June 1985, the Bureau of Mines conducted a mineral investigation of a part of the 119,700-acre Eagletail Mountains Wilderness Study Area in La Paz, Maricopa, and Yuma Counties, southwestern Arizona, as authorized by Public Law 94-579, October 21, 1976. Prospecting has occurred in and near the study area; there was no mining activity at the time of this investigation. Forty tons of manganese ore was mined from the Eagletail mining district from an undetermined location.

Sixty-five samples were taken, five from within the study area. Field and sample data did not indicate any identifiable resources.

INTRODUCTION

In April and June 1985, the Bureau of Mines, in a cooperative program with the U.S. Geological Survey (USGS), studied the mineral occurrences of a part of the Eagletail Mountains Wilderness Study Area (WSA), La Paz, Maricopa, and Yuma Counties, Arizona, on lands administered by the Bureau of Land Management (BLM) Phoenix District Office. The WSA comprises 119,700 acres; the Bureau studied the 70,230 acres deemed preliminarily suitable for inclusion in the National Wilderness Preservation System. "Study area" (SA) as used in this report refers only to the smaller area and is shown on plate 1. The Bureau surveys and studies mines, prospects, and mineralized areas to appraise reserves and identified subeconomic resources. The USGS assesses the potential for undiscovered mineral resources based on regional geological, and

reconnaissance geochemical and geophysical surveys. This report presents the results of the Bureau of Mines study, which was completed prior to the USGS investigation. The USGS will publish the results of their studies. A joint USGS-Bureau report, to be published by the USGS, will integrate and summarize the results of both surveys.

Geographic setting

The Eagletail Mountains SA, in eastern La Paz and Yuma and western Maricopa Counties, southwestern Arizona, lies about 70 mi west of Phoenix and 7 mi south of Interstate 10 (fig. 1). The area encompasses the Eagletail Mountains, part of Cemetery Ridge, and the alluvial plain in between. Access to the SA is by improved and unimproved roads off Interstate 10; a few unimproved roads extend to and into the study area.

Terrain is typical of the desert southwest; steep, jagged mountains rise above broad alluvial plains. Vegetation is sparse and consists mostly of cacti, mesquite, palo verde, and small shrubs.

Methods of evaluation

Bureau personnel reviewed literature concerning mining and geology of the region. In addition, BLM records were reviewed for mining claim information, patented claim locations, and oil and gas leases and lease applications.

About 20 man-days were spent examining mines and prospects inside and within approximately 1 mi of the SA boundary (pl. 1). Surface and underground surveys were made by compass and tape method. Mines and prospects were mapped and sampled.

Sixty-five grab, select, and chip samples were taken; five samples were from within the SA (table 1). All samples were fire assayed for gold and silver (table 2); selected samples were analyzed by semiquantitative emission

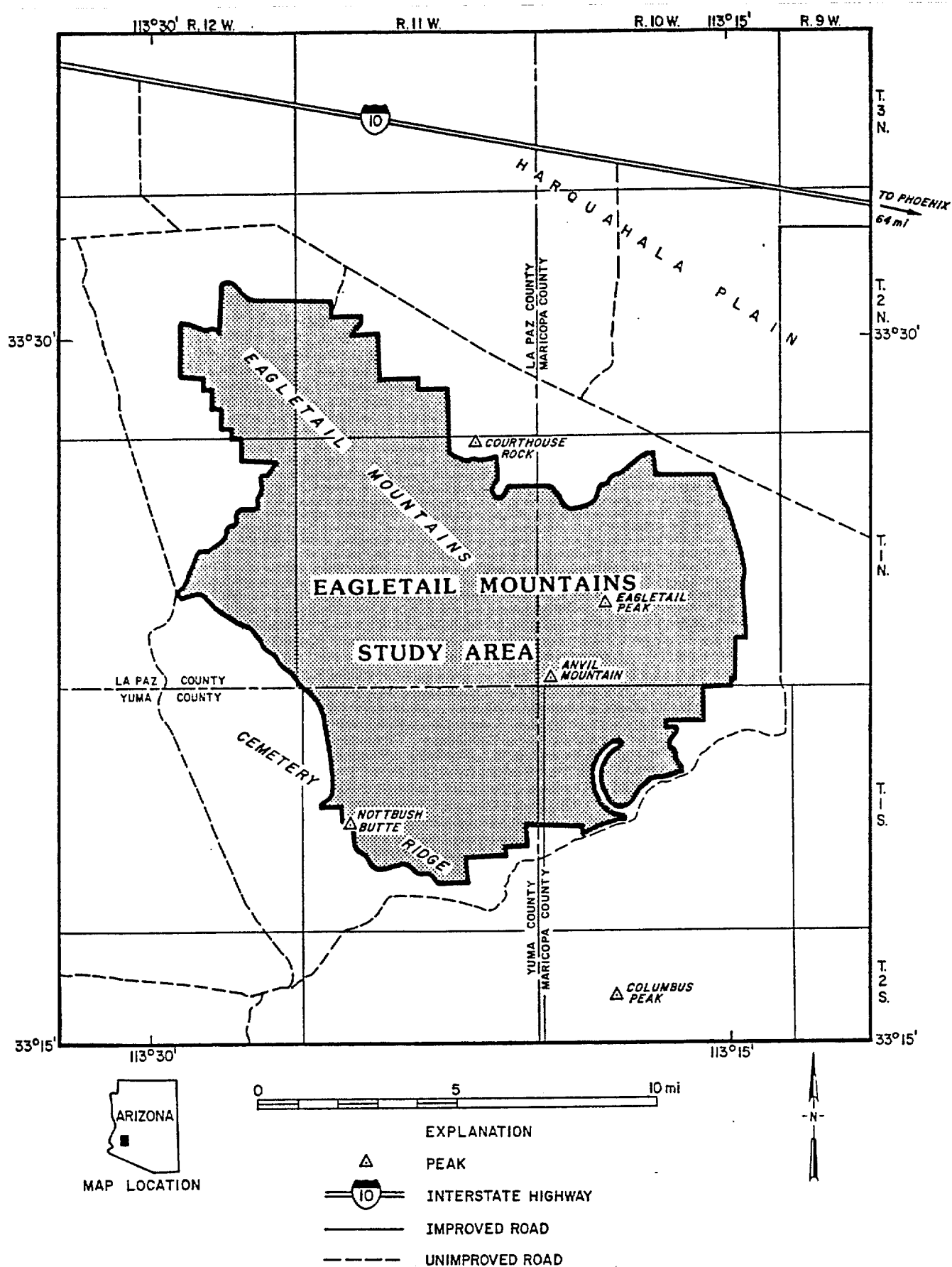


Figure 1.--Index map of the Eagletail Mountains Study Area, La Paz, Maricopa, and Yuma Counties, Arizona.

spectrographic methods for 40 elements. Some samples contained visible copper and manganese minerals and were analyzed by atomic absorption methods for copper and manganese. Complete analytical data for all samples are available for public inspection at the Bureau of Mines, Intermountain Field Operations Center, Building 20, Denver Federal Center, Denver, Colorado.

GEOLOGIC SETTING

The study area is in the Basin and Range physiographic province. The northwest-trending Eagletail Mountains and, to the south, the parallel Cemetery Ridge are composed of Cretaceous to Quaternary andesites, basalts, tuffs, and dikes and plugs of rhyolitic to andesitic composition. Quaternary sand and gravel forms the alluvial fringes of the mountains and fills the broad valley between Cemetery Ridge and the Eagletail Mountains. Paleozoic limestone crops out near the southeast boundary of the study area at the Double Eagle Mine. Isolated outcrops of Precambrian schist, granite, and gneiss also occur in the southeast part of the SA. (See Wilson and others, 1957; Wilson, 1960.)

MINING HISTORY

The study area is in the Eagletail mining district where prospecting began in the 1860's and has been sporadic since. The only reported production from this district is 40 tons of 22% manganese ore from an undetermined location (Keith, 1978, p. 34-36). Decorative stone (tuff) was quarried adjacent to the northern boundary of the SA. Approximate locations of mining claims in and near the SA are shown on plate 1; no workings were found at the claims in the study area.

ENERGY RESOURCES

Although oil and gas leases cover most of the study area (fig. 2), it is considered to have low to zero potential for hydrocarbons (Ryder, 1983, p. C19-20).

On the east, the SA bounds an "...area of significant lateral extent favorable for discovery and development of local resources of low temperature (<90°C) geothermal water..." (Sammel, 1979, map 1). To the northwest, several thermal wells were drilled in the alluvium of Centennial Wash (pl. 1). The deepest hole was 2,011 ft. These wells encountered shallow, low temperature (35°C to 40°C) geothermal waters (Arizona Bureau of Geology and Mineral Technology, 1982).

APPRAISAL OF SITES EXAMINED

Six mineralized areas, one inside and five outside the SA, were examined and sampled (pl. 1; table 1). These areas were grouped arbitrarily by geographic location for discussion. Identified mineralization in the study area (samples 56-60) consisted of minor amounts of silver and copper (table 2, samples 56, 59, and 60), but the amount of mineralization and extent are small and no resources could be identified. The samples were taken across faults in diorite(?). The other sampled areas are within 1 mi of the SA and had detectable, but not anomalous, gold, silver, copper, and manganese (table 2; figs. 3 and 4). At these five sites, no resources could be identified. Samples taken in these five areas were in short, narrow faults, fractures, and breccia zones in diorite, diabase, phyllite, granite, and limestone. Some samples were of quartz veins or pods within faults.

Three quarries in green tuff, less than 1/4 mi north of the SA, were sampled. The tuff dips steeply south and may underlie the northern part of the

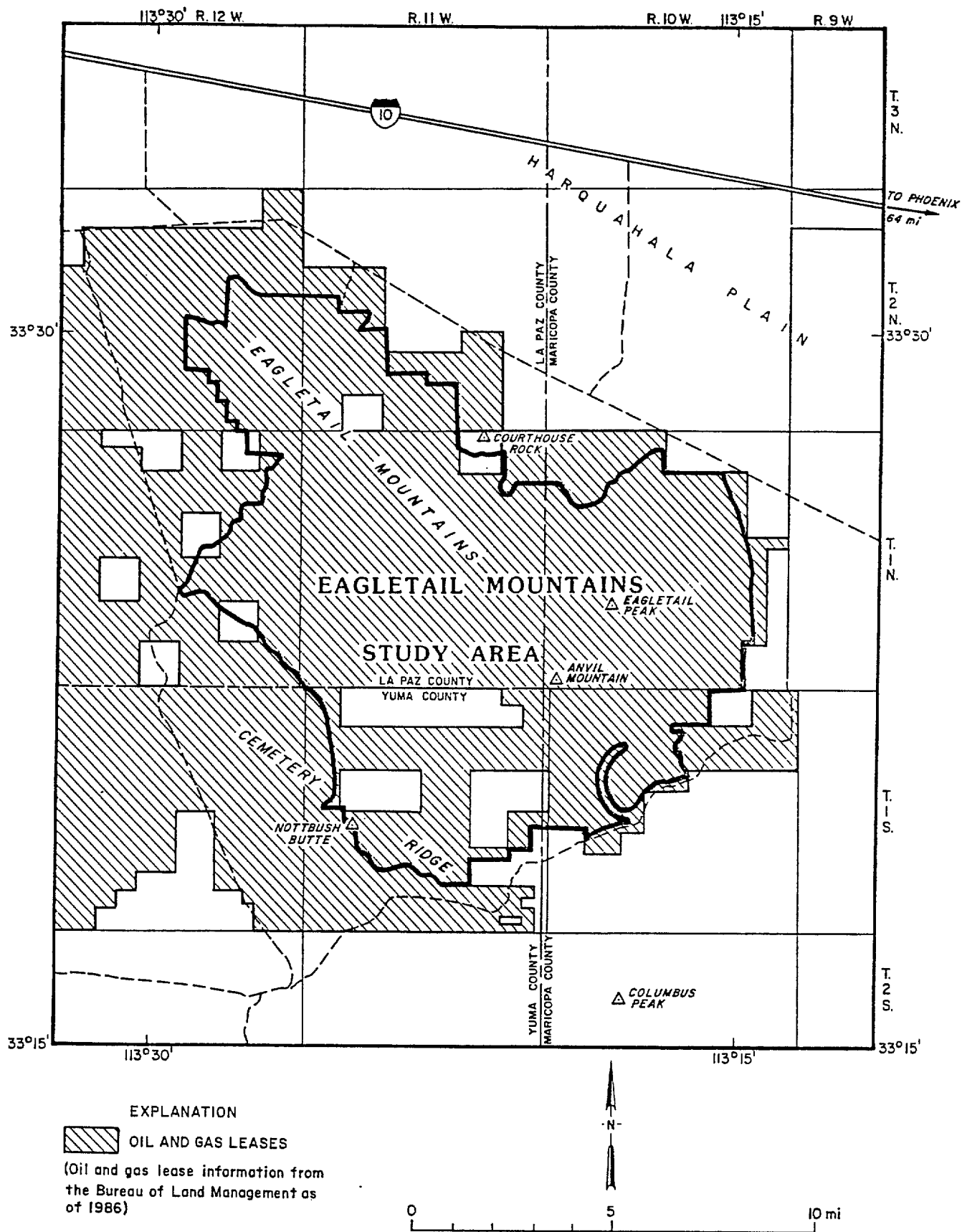


Figure 2.--Oil and gas leases in and near the Eagletail Mountains Study Area, La Paz, Maricopa, and Yuma Counties, Arizona.

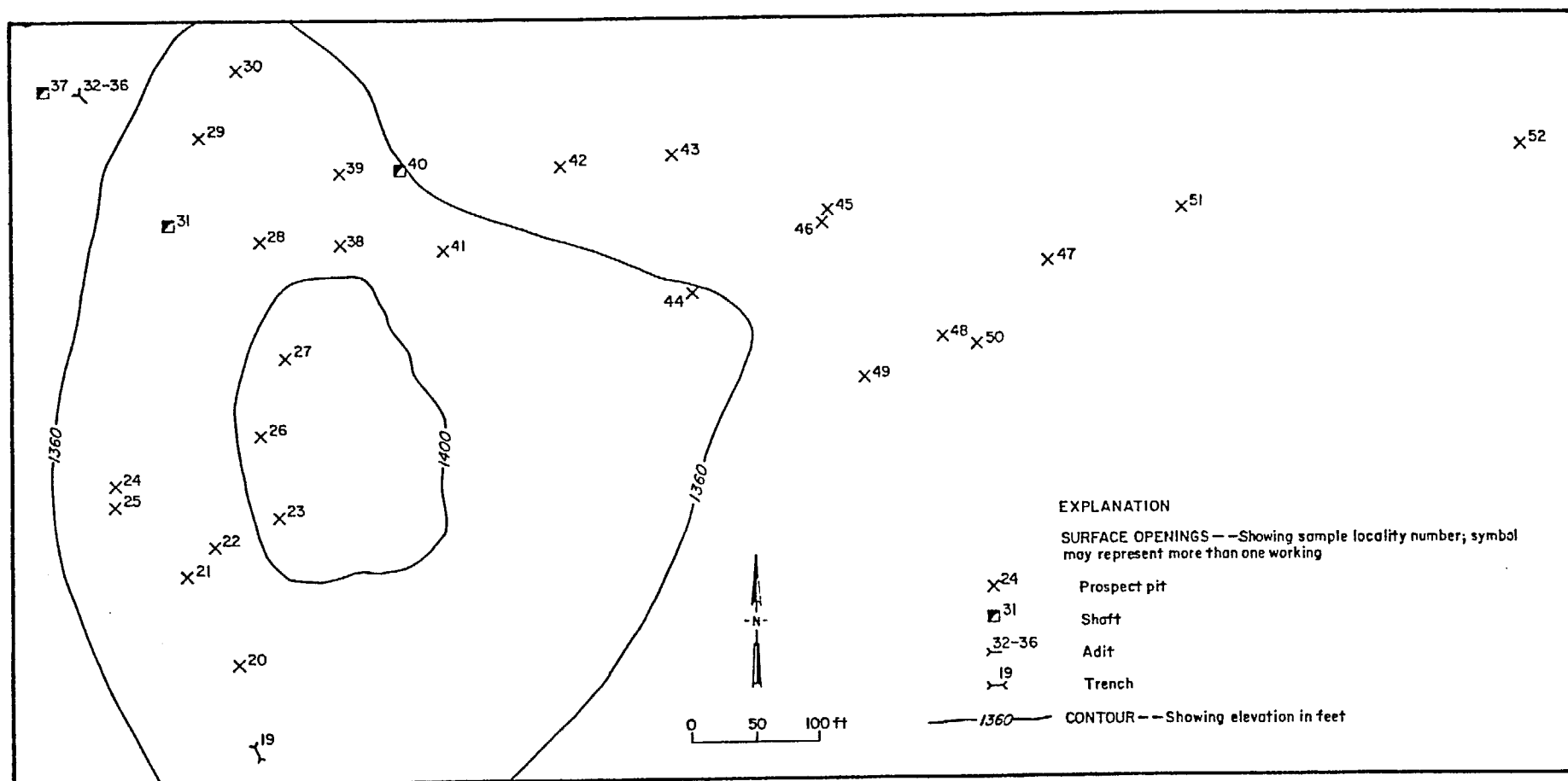


Figure 3.--Sample localities 19-52 near the Eagletail Mountains Study Area, La Paz, Maricopa, and Yuma Counties, Arizona. (See pl. 1, NE 1/4 sec. 11, T. 1 S., R. 10 W.)

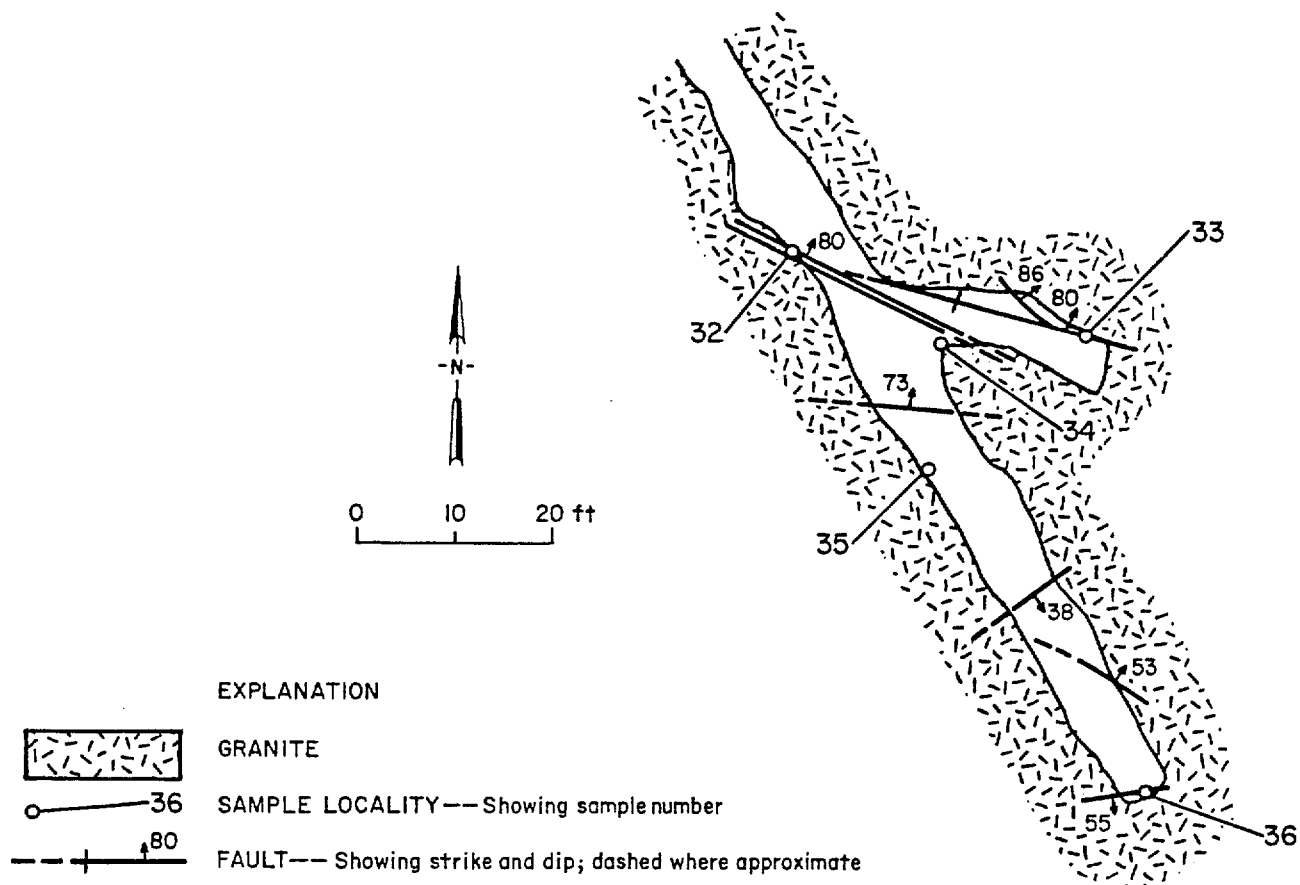


Figure 4.--Sample localities 32-36 taken near the Eagletail Mountains Study Area, La Paz, Maricopa, and Yuma Counties, Arizona.

SA. No anomalous metal content was detected in samples from the tuff (table 1, samples 61-65). The tuff was probably quarried for use as decorative stone.

CONCLUSIONS

No mineral resources were identified in the SA; mineral occurrences are widely scattered, sparse, and discontinuous, with low metal contents. Decorative stone (tuff) which was quarried adjacent to the north boundary, dips steeply towards and under(?) the SA. If the tuff extends under the area it would be too deep to mine by surface methods and the likelihood for its development is low.

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- Wilson, E. D., Moore, R. T., Peirce, H. W., 1957, Geologic map of Maricopa County, Arizona: Arizona Bureau of Mines, University of Arizona, scale 1:375,000.

Table 1.--Sampled areas in and near the Eagletail Mountains Study Area, La Paz, Maricopa, and Yuma Counties, Arizona.

[Detailed sample descriptions are shown on table 2. Au, gold; Ag, silver; Cu, copper; Mn, manganese.]

Sample Nos.	Name	Summary	Workings	Sample data
1-14	Cemetery Ridge.	Faults, fractures, and breccia in diorite, diabase, latite, and tuff; locally weathered and sheared; copper, manganese, iron (specularite) minerals; mineral occurrences scarce.	Three inaccessible shafts, 10 pits.	Two samples contained 0.43% and 0.37% Cu, four samples contained Mn between 1.35% and 20%.
15-18	Double Eagle Mine area.	Limestone overlying phyllite; limestone and phyllite dump material; brecciated limestone in pit.	Two inaccessible shafts, one pit.	Minor Cu, 0.43% and 1.15% in two samples; one sample 0.01 oz/st gold; two samples contained silver, 1.8 oz/st and 0.1 oz/st.
19-52	Unknown	Faults and diabase dikes in granite; granite often altered, sheared, and containing specularite, quartz veins and pods, and copper minerals; several sample localities are brecciated; copper occurrences were minor.	Three inaccessible shafts, 25 pits, 1 adit, 1 trench.	Eight samples contained Cu between 0.092% and 10%.
53-55	Unknown	Small hill composed of phyllite near Double Eagle Mine; numerous quartz veinlets and pods.	Three small pits.	One sample contained trace of gold; two samples contained 0.1 oz/st silver.
56-60	Granite Mountain.	Faults in diorite(?); specularite.	One shaft, one adit, two pits.	One sample contained 0.1 oz/st silver; two samples contained Cu, 0.274% and 0.79%.
61-65	Unknown	Tuff quarried possibly for decorative stone; operation small and apparently unsuccessful; dipping steeply toward the SA.	Small quarries.	No metal values.

Table 2.--Analytical and sample data for samples 1-65 taken in and near the Eagletail Mountains Study Area, La Paz, Maricopa, and Yuma Counties, Arizona.

[Au, gold; Ag, silver; Cu, copper; Mn, manganese; ---, not detected; Tr, trace; %, percent; xx, not applicable; detection limits for Au and Ag are 0.005 oz/st and 0.1 oz/st, respectively.]

No.	Sample		Assay data		Sample description
	Type	Length	Au oz/st	Ag oz/st	
1	chip	49 in.	---	---	Fault in coarse-grained gabbroic diorite; chrysocolla and limonite coatings in fault; 0.43% Cu.
2	grab	random	---	---	Coarse-grained diorite; malachite stained float; 1 in. pods of biotite.
3	chip	42 in.	---	---	Fractures in gabbroic diorite; no visible mineralization.
4	do.	24 in.	---	---	Do.
5	grab	random	---	---	Fragments of diorite and silicified fault gouge in rhyolite(?); quartz stringers; chrysocolla; 0.37% Cu.
6	chip	17 in.	Tr	---	Fault zone in fine-grained diabase; sparse siliceous zones along fault as wide as 6 in.; calcite on fractures.
7	do.	24 in.	---	---	Sheared and fractured diorite or gabbro(?); weathered near latite contact.
8	do.	12 in.	---	---	Contact between gray latite and diorite or gabbro(?); no visible mineralization.
9	do.	12 in.	---	---	Caliche-filled fracture near diorite-latite contact.
10	grab	random	---	---	Stockpile; breccia consisting of manganese oxide and specularite(?); siliceous, gray weathered tuff; 20% Mn.
11	chip	27 in.	---	---	Weathered tuff and small zone of brecciation; 0.1% Mn.
12	do.	14 in.	---	---	Silicified, brecciated vein in tuff; manganese oxide and specularite; 7.7% Mn.
13	do.	25 in.	---	---	Zone of iron- and manganese oxide-rich breccia in tuff; weathered, cemented with manganese oxide; 1.35% Mn.
14	do.	13 in.	---	---	Veinlets and pods of manganese oxide and specularite in siliceous, tuffaceous breccia; 3.7% Mn.

Table 2.--Analytical and sample data for samples 1-65 taken in and near the Eagletail Mountains Study Area, La Paz, Maricopa, and Yuma Counties, Arizona--Continued

No.	Sample		Assay data		Sample description
	Type	Length	Au oz/st	Ag	
15	grab	5-ft grid	---	---	Dump material; phyllite; no visible mineralization.
16	do.	random	---	---	Dump material; limestone; calcite-filled fractures; 0.43% Cu.
17	select	xx	0.01	1.8	Dump material; cavity fillings in limestone; chrysocolla, minor malachite, galena, quartz, fluorite and possibly barite; 1.15% Cu.
18	chip	24 in.	---	.1	Silicified breccia in limestone.
19	do.	13 in.	---	---	Fault breccia in altered granite; quartz, specularite, and minor hematite staining in fault.
20	do.	7 in.	---	---	Fault in granite; sparse specularite in fault.
21	do.	20 in.	Tr	---	Quartz vein in altered granite; chloritic alteration; no visible mineralization.
22	do.	33 in.	---	.4	Breccia containing quartz pods and minor hematite and limonite staining in granite.
23	do.	24 in.	---	.3	Fractured granite; minor specularite in fractures.
24	do.	20 in.	---	---	Sheared and brecciated unidentified dike rock in granite.
25	do.	21 in.	---	---	Diabase-granite contact; altered granite (gneiss?); highly fractured.
26	do.	20 in.	---	---	Quartz vein containing minor specularite in altered granite; bleached diabase dike nearby.
27	do.	17 in.	---	.5	Shear zone in granite; brecciated quartz- and specularite-filled vugs; 0.092% Cu.
28	grab	random	Tr	---	Dump material; altered granite or gneiss(?); quartz and minor specularite in fractures; minor chrysocolla staining; 0.36% Cu.

Table 2.--Analytical and sample data for samples 1-65 taken in and near the Eagletail Mountains Study Area, La Paz, Maricopa, and Yuma Counties, Arizona--Continued

No.	Sample		Assay data		Sample description
	Type	Length	Au oz/st	Ag	
29	chip	15 in.	---	0.1	Fractured and altered granite; minor specularite and quartz, minor hematite staining.
30	do.	16 in.	Tr	.2	Silicified breccia in granite; well-defined granite fragments as large as 2 in.; minor chrysocolla, quartz stringers, chlorite alteration in breccia; 1.60% Cu.
31	select	xx	---	3.9	Dump material; brecciated quartz and sheared granite; specularite and malachite; 10% Cu.
32	chip	14 in.	---	---	Sheared and brecciated granite; specularite.
33	do.	15 in.	---	1.1	Sheared and altered granite; specularite and malachite in fractures.
34	do.	17 in.	Tr	.2	Fault in altered granite; minor specularite.
35	do.	20 in.	---	---	Fractured granite; specularite in quartz pod or siliceous zone.
36	do.	17 in.	---	.1	Fractured and altered granite; quartz pods containing minor specularite.
37	grab	5-ft grid	---	.2	Dump material; brecciated granite; specularite, chrysocolla, malachite; 1.60% Cu.
38	chip	23 in.	Tr	.2	Small fault in altered and fractured granite; specularite in fractures; sparse chrysocolla staining.
39	do.	45 in.	Tr	---	Diabase-granite contact; granite fractured and altered; minor specularite in fractures.
40	grab	5-ft grid	Tr	---	Dump material; altered and sheared granite; breccia filled with specularite and quartz; minor chrysocolla and hematite staining; 0.283% Cu.
41	chip	60 in.	Tr	.5	Fault in altered diabase dike near contact with granite; quartz, specularite, minor malachite and chrysocolla; 0.283% Cu.

Table 2.--Analytical and sample data for samples 1-65 taken in and near the Eagletail Mountains Study Area, La Paz, Maricopa, and Yuma Counties, Arizona--Continued

No.	Sample		Assay data		Sample description
	Type	Length	Au oz/st	Ag	
42	chip	26 in.	Tr	0.2	Brecciated fault gouge in granite; slickensides, silicified specularite matrix in breccia, minor chrysocolla; chloritized, feldspar altered to clay; 0.59% Cu.
43	do.	6 in.	Tr	.2	Brecciated quartz vein containing specularite in altered granite; minor chrysocolla, hematite staining.
44	do.	26 in.	---	.1	Silicified breccia zone in altered granite; specularite, hematite, minor chrysocolla and malachite in breccia zone.
45	do.	15 in.	0.01	---	Schist-diabase contact; very fractured and deformed; abundant specularite at contact.
46	do.	13 in.	---	---	Very fractured, brecciated, and sheared granite; quartz and specularite.
47	do.	24 in.	---	---	Diabase dike-granite contact; blebs of specularite in quartz along contact.
48	do.	36 in.	Tr	.2	Fault at diabase-granite contact; mostly gouge, highly fractured, small seams of specularite and hematite, minor chrysocolla.
49	do.	22 in.	Tr	.1	Small diabase dike in altered and fractured granite; specularite as fracture fillings.
50	do.	15 in.	---	---	Silicified breccia zone in highly fractured and altered granite; small inclusions of hematite in breccia zone.
51	do.	20 in.	---	---	Sheared granite; minor specularite, quartz, and chloritic alteration along shear.
52	do.	30 in.	---	---	Large silicified breccia zone in altered and fractured granite; abundant specularite, hematite, minor chrysocolla, malachite, and chloritic alteration along breccia zone.
53	do.	24 in.	Tr	.1	Quartz veinlets containing specularite and calcite in green phyllite.
54	do.	14 in.	---	---	Quartz vein containing minor specularite in green phyllite.

Table 2.--Analytical and sample data for samples 1-65 taken in and near the Eagletail Mountains Study Area, La Paz, Maricopa, and Yuma Counties, Arizona--Continued

No.	Sample		Assay data		Sample description
			Au	Ag	
	Type	Length	oz/st		
55	chip	17 in.	---	0.1	Fault containing quartz pods to 10 in. long in phyllite; small seams of calcite and quartz along fault.
56	do.	18 in.	---	.1	Fault containing specularite and hematite in diorite.
57	do.	62 in.	---	---	Fault gouge containing hematite, limonite, calcite, in diorite; fragments of wallrock in fault.
58	do.	8 in.	---	---	Fault gouge containing minor hematite in diorite.
59	grab	5-ft grid	---	---	Dump material from shaft; altered granite, massive hematite, lesser amounts of specularite, minor malachite; 0.274% Cu.
60	chip	16 in.	---	---	Fault filled with hematite, minor chrysocolla along fault; gouge contains fragments of diorite country rock; 0.79% Cu.
61	grab	random	---	---	Light-green tuff, probably quarried for decorative stone; fractured, poorly sorted, coarse to fine-grained, sandstone-like texture; no visible mineralization.
62	do.	random	---	---	Do.
63	chip	29 in.	---	---	Do.
64	do.	30 in.	---	---	Diabase dike-tuff contact; weathered and fractured, tuff is banded and coarse grained.
65	do.	30 in.	---	---	Poorly sorted green tuff.

STUDY OF
EAGLE TAIL
ADDITIONS

MINERAL APPRAISAL OF THE EAGLETAIL MOUNTAINS ADDITIONS, ARIZONA

by Michael E. Lane*

The Bureau of Mines completed a mineral investigation of the Eagletail Additions study area in April 1988. The additions to the Eagletail Wilderness Study Area (AZ-020-128) comprise 7,790 acres adjacent to the much larger Eagletail Wilderness Study Area studied previously (Lane, 1986). The largest addition on the east side of the Eagletail study area and is alluvial outwash. Smaller additions are on the north side, along the northeast boundary, and a small addition on the east side.

Only two pits and one inaccessible shaft were found in the additions and a total of four samples was taken. These samples were taken on a small knoll about 1/2 mi southeast of Courthouse Rock.

No mineral resources were identified in the additional area studied. Minor gold was found in two samples; overall the analytical results were low. The table provides sample and analytical data.

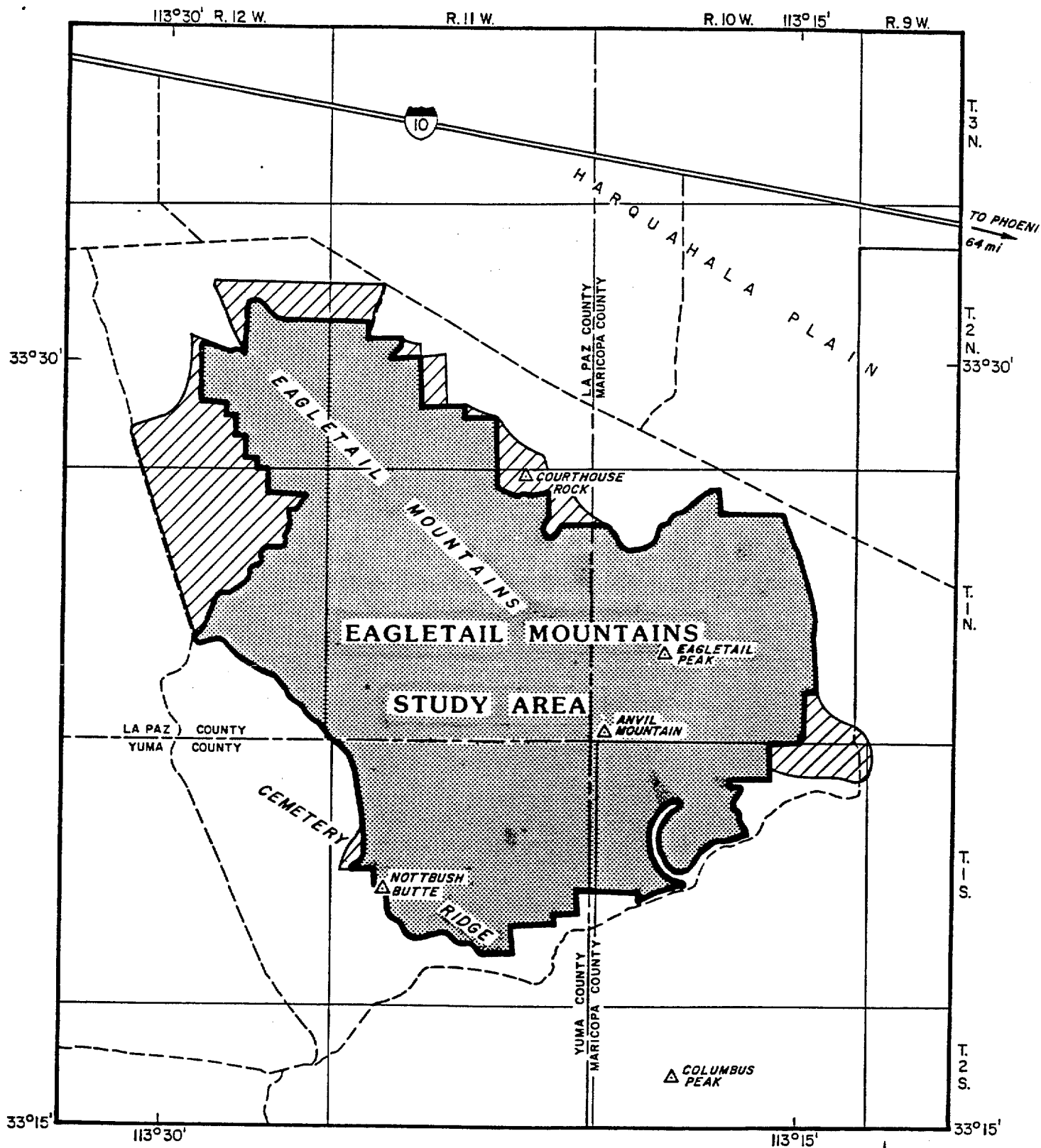
No.	Sample		Description
	Type	Length	
1	Chip	28 in	Fault striking N. 33° W. and dipping 80° NE. in andesite near contact with granite. Copper staining in float and dump material. Gold content was 6 ppb.
2	do.	48 in.	Fault along andesite-granite contact striking N. 80° W. and dipping 60° N. Quartz vein as wide as 10 in.; minor copper staining. Material is highly fractured and locally silicified. Gold content was <5 ppb.
3	Chip	48 in.	Fault along andesite-granite contact striking N. 40° W. and dipping 78° NE. Minor copper staining and clay alteration. Gold content was <5 ppb.

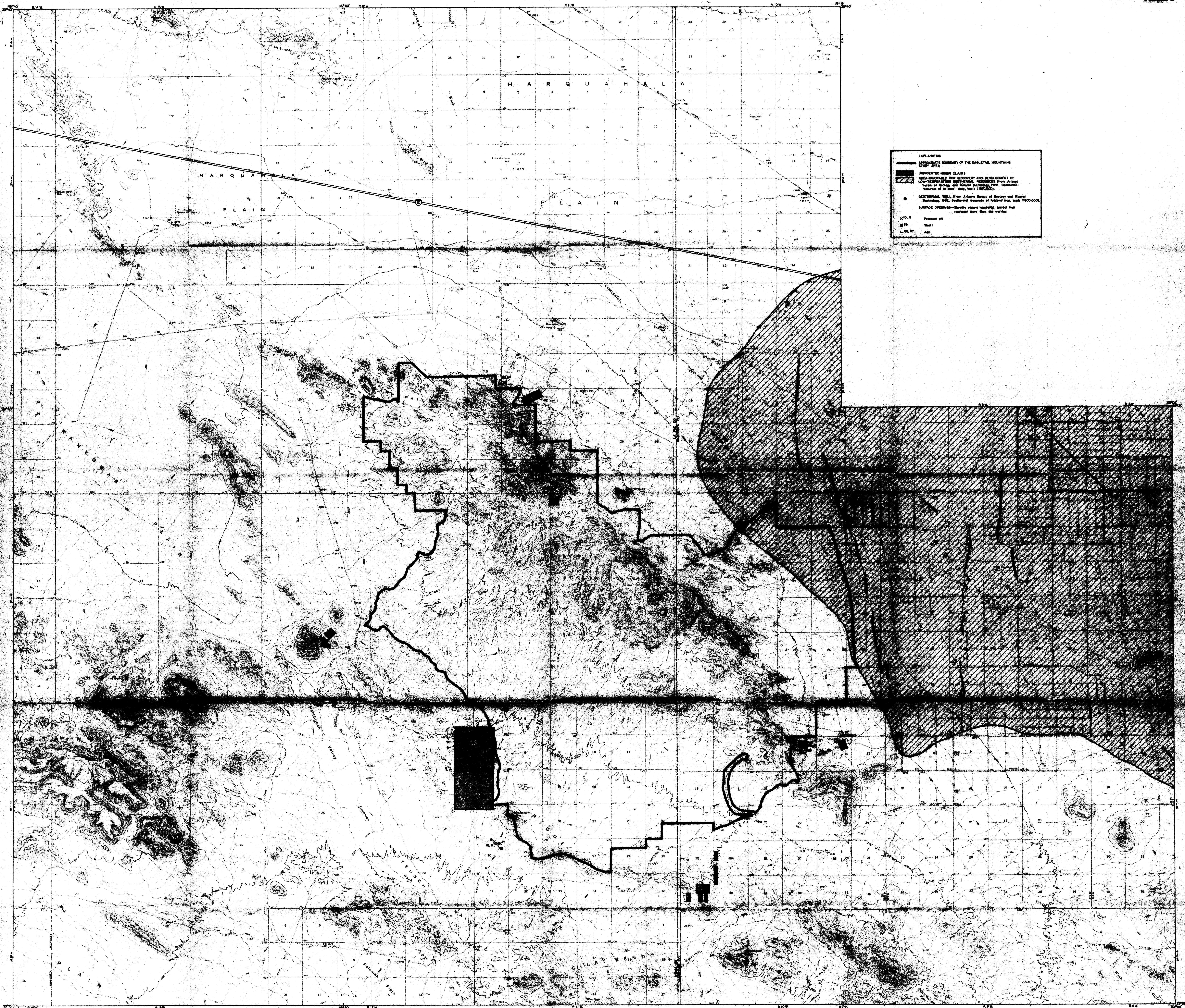
*Physical Scientist, Intermountain Field Operations Center, U.S. Bureau of Mines, Denver, Federal Center, Denver, CO 80225. (303) 236-3400

No.	Sample		Description
	Type	Length	
4	Select grab		Brecciated quartz from dump; hematite and specularite in matrix and very vuggy. Gold content was 21 ppb (0.001 oz/st).

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Lane, M. E., 1986, Mineral investigation of a part of the Eagletail Mountains Wilderness Study Area (AZ-020-128), La Paz and Maricopa Counties, Arizona: U.S. Bureau of Mines Open-File Report MLA 45-86, 16 p.





MINE AND PROSPECT MAP OF THE EAGLETAIL MOUNTAINS STUDY AREA, LA PAZ, MARICOPA, AND YUMA COUNTIES, ARIZONA

BY
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1986